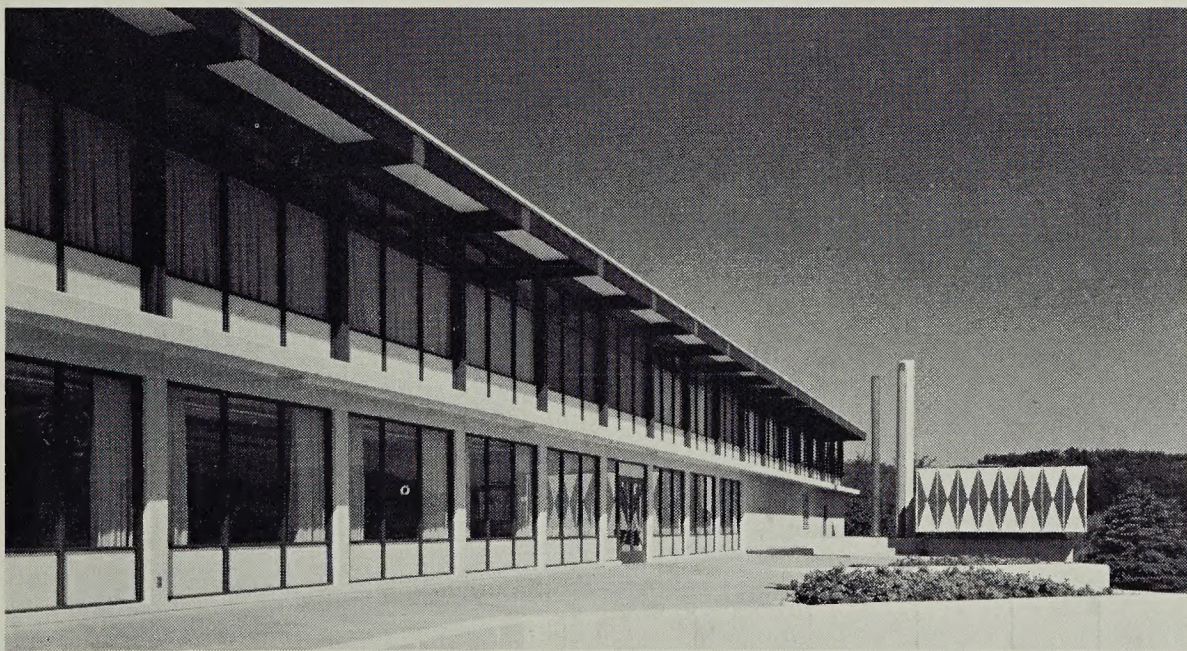


ARMCO METALLIC-COATED STEELS **FOR** **ARCHITECTURE**



A GUIDE FOR DESIGN AND SPECIFICATION
OF ZINC- AND ALUMINUM-COATED STEEL



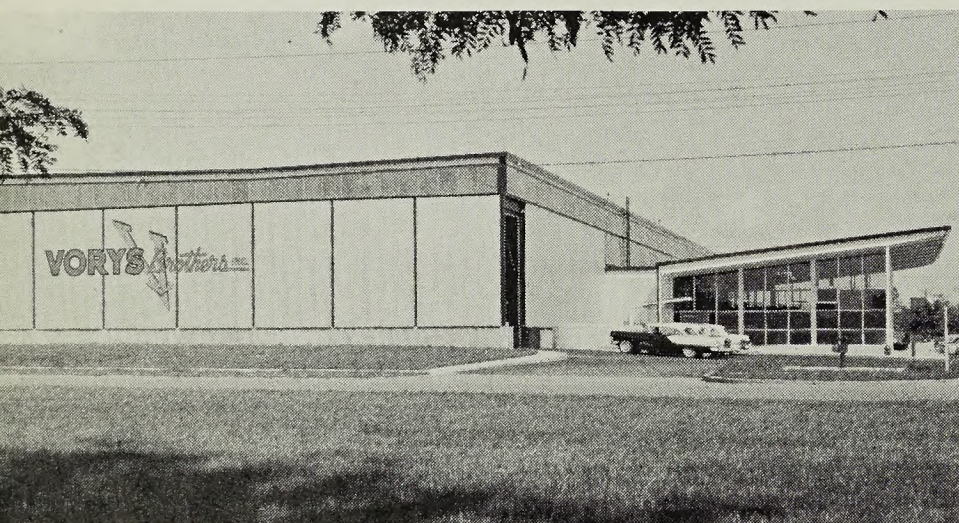
ARMCO METALLIC-COATED STEELS **FOR** **ARCHITECTURE**



COVER PHOTOGRAPHS

Leo A. Daly Building, Omaha, Nebraska
Architects: Leo A. Daly Company

Bell's of Burien, Burien, Washington
Architect: Ralph H. Burkhard, AIA



**Vorys Brothers Inc. Warehouse
and Office, Columbus, Ohio**
Architects: Brooks and
Coddington

The combination of structural strength and a pleasing durable surface make ALUMINIZED STEEL Type 2 especially suitable for all types of building panels.



The Armco Triangle, ZINCGRIP and PAINTGRIP are registered trademarks of Armco Steel Corporation.

Steels protected against rust and corrosion by metallic coatings, especially aluminum or zinc, are of primary interest to architects because they provide a means of achieving economical, efficient architecture. Armco Steel Corporation, developer of the process for continuously hot-dip zinc-coating sheet steel and producer of the first hot-dip aluminum-coated steel, has accumulated extensive experience in the production and application of metallic-coated steels.

This booklet summarizes that experience to provide the specification writer and the designer with essential information on steels with protective coatings of aluminum and zinc. Only data directly pertinent to architectural design and specification are included. However, Armco has a complete free library of technical information on these materials. The services of Armco metallurgists, engineers and marketing specialists are also available to you. Just write to any of the Armco offices listed on the back cover, requesting the information you need.

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METALLIC-COATED STEELS IN CONTEMPORARY ARCHITECTURE

In the past twenty-five years major developments in metallic-coated steels have made them important architectural metals.

Two of the most important occurrences in the history of metallic-coated steels were the invention of the continuous method of hot-dip coating sheet steel with zinc, and the adaption of that process to make hot-dip aluminum-coated steel. The first of these, Armco's continuous process, made possible sheet steel with a tightly adherent zinc coating that won't flake or peel despite severe forming or drawing. More precise control, possible with a continuous process, assures excellent coating uniformity, thereby increasing service life of the product.

The second major development, aluminum-coated sheet steel created a new architectural metal. It combines the strength of steel with the surface characteristics of aluminum and provides unusual resistance to atmospheric corrosion. Service in architectural applications and exposure tests indicate this hot-dip aluminum coating has approximately *four times* the life of an unpainted commercial-weight zinc coating.

In addition to the fundamental advantages of metallic-coated steels, other developments in contemporary architecture have made them of extreme importance to architects. The first of these is architectural design. Metal curtain walls, factory produced modular units, more mechanical services, and simplified construction have increased the demand for steel with low-cost protection against corrosion. Other developments include improved production processes, such as roll-forming. These have provided the architect with formed steel sections and fabricated steel products that combine structural efficiency, durability and economy.

To make full and most effective use of the advantages of metallic-coated steels requires not only a basic but architecturally-complete knowledge of the materials. The following pages briefly review the properties of zinc- and aluminum-coated steels that are of pertinent interest to architects.

◀ Roof decking of Armco ALUMINIZED STEEL not only resists atmospheric corrosion but eliminates the need for painting. In addition, its high strength permits reductions in decking and structural costs.



FUNDAMENTALS OF ZINC- AND ALUMINUM- COATED STEELS

The prime function of zinc or aluminum coatings on sheet steel is to permit the excellent mechanical properties of steel to be used with assurance of reliable durability. Both coatings provide excellent resistance to atmospheric corrosion at very low cost. However, their mechanism of protection is not the same, and their weatherability and service life differ appreciably. The following sections present a summary of the fundamental features of these coated sheet steels as they apply to their specification in architecture.

Zinc-Coated Steels

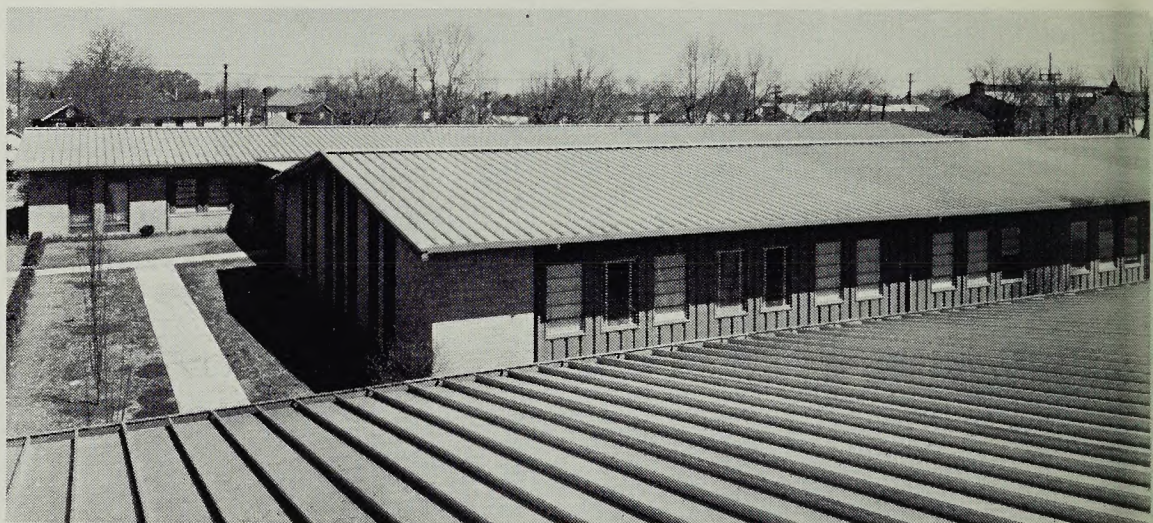
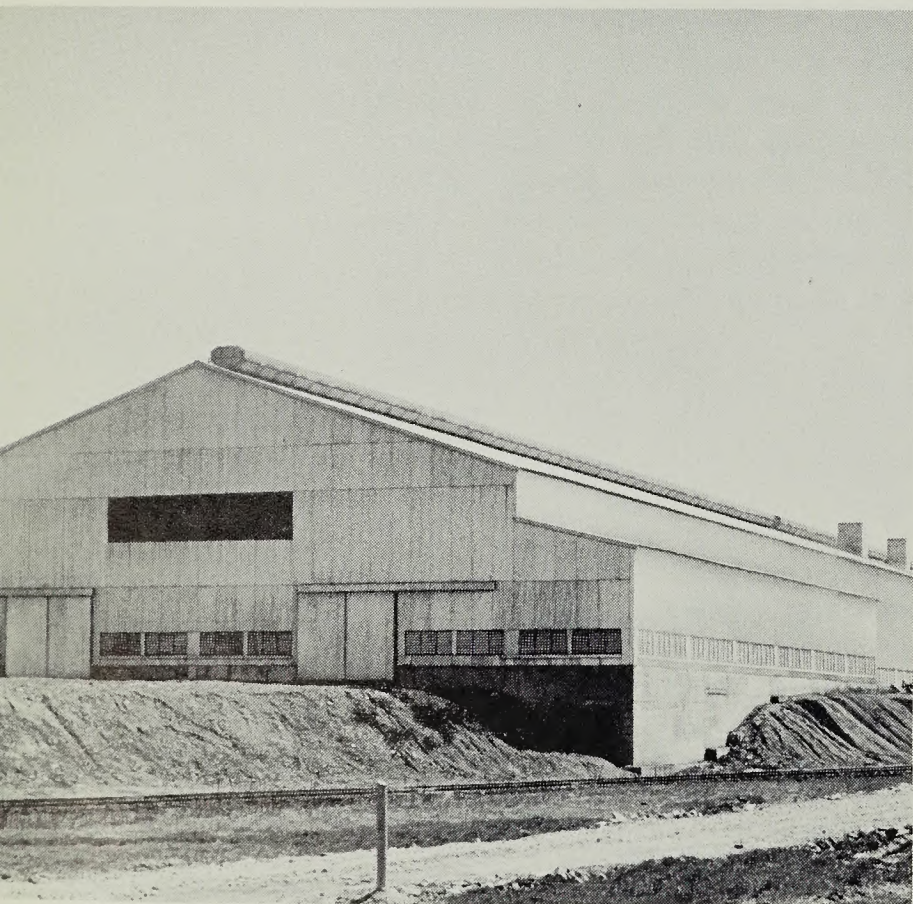
Zinc protects steel from corrosion by a two-fold action. The coating serves as a protective barrier that seals out moisture and other atmosphere-borne corrodents. It also protects the steel base by galvanic action. This is an electrochemical phenomenon in which zinc is consumed, and by such action protects the steel from attack.

Durability Factors

The effective life of zinc coatings depends upon their thickness or weight, the uniformity of the coatings, and the adherence of the coatings to the base metal. No matter which method is used to apply the zinc—hot-dipping or electroplating—the heavier the coating, the longer will be the rust-free life of the base metal.

For architectural use, zinc-coated sheet steels can be classified into two general types: 1. Those with ordered weight coatings of 1.25 oz. per square foot and heavier, used where exposures require lasting protection against rust; 2. Steels with coatings of approximately 0.1 oz. per square foot. They provide only minimum protection against rust and must usually be painted for satisfactory durability.

Inasmuch as a 1.25 oz. commercial coating of zinc (both sides) gives the most economical protection for a wide range of applications, it is specified as the com-



▲ Durability, attractive appearance and high heat reflectivity make Armco ALUMINIZED STEEL Type 2 excellent for roofing.

◀ ALUMINIZED STEEL corrugated roofing and siding provide a unique combination of strength, atmospheric corrosion resistance and low cost that makes it an efficient material for industrial building.

mercial or standard weight coating. This weight produces a zinc coating approximately .001" thick on each side.

Most zinc-coated steel for architectural use is specified commercial weight. However, heavier coatings can be supplied where severe exposures call for increased durability. The precise control of continuous hot-dip galvanizing methods makes it possible to produce uniform zinc coatings in weights up to approximately 2.50 oz. per square foot.

Where appearance dictates, properly prepared hot-dip zinc-coated steels can be readily painted. The full-weight coating gives lasting protection that materially increases paint life. Light-weight zinc coatings of only 0.1 oz. per square foot are normally applied by electroplating rather than the hot-dip process. While such coatings will protect the steel base from rusting during storage and fabrication, they are not heavy enough to provide effective protection for outdoor use or interior applications exposed to moisture. These lightly-coated steels are normally specified only for painted parts and interior exposures. They provide better protection than painted cold-rolled steel but do not match the durability of either painted or unpainted hot-dip zinc-coated steels.

Aluminum-Coated Steel

Aluminum-coated sheet steel, or Armco ALUMINIZED

STEEL, as it is more commonly known, is steel protected by a hot-dip coating of aluminum. Two different grades are produced. One has outstanding resistance to a combination of heat and corrosion. The other type, of primary interest to architects, has excellent resistance to atmospheric corrosion. This is the only type that will be discussed in this booklet. Likewise, all durability data is based on Armco's product, ALUMINIZED STEEL Type 2. This is necessary because until quite recently Armco Steel Corporation was the only producer of hot-dip aluminum-coated steels.

Manufactured by the Armco process, hot-dip aluminum coatings are applied by passing steel strip through a molten aluminum bath. This continuous, precisely-controlled method creates coatings that are uniform both in thickness, composition, and appearance. The protective aluminum coating on both sides of the sheet, is approximately .002" thick.

How Aluminum Protects

Aluminum coatings protect steel from rust by providing a durable barrier that prevents moisture and other corrodents from reaching the base metal. Even though aluminum is close to zinc in the galvanic series, its effectiveness in preventing corrosion by galvanic action is much less than that of zinc. This means that cut edges must be concealed because they may show some rust. Such rusting is limited to the edge itself and no rust bleeding or undercutting of the aluminum coating occurs. Except for this relatively minor factor, hot-dip aluminum coatings resist atmospheric corrosion much better than unpainted zinc coatings.

Durability of Aluminum Coatings

On the basis of exposure tests and corroborating service experience, Armco corrosion engineers estimate that the coating on ALUMINIZED STEEL will last four times as long in industrial atmospheres as unpainted standard weight galvanized coatings. This estimate is substantiated by sheets of ALUMINIZED STEEL that are still being protected by the aluminum coating after twenty-one years' exposure in an industrial atmosphere. And their condition, shown in Figure 3, indicates many more years of protection for the steel base.

Aluminum-coated steel weathers much like aluminum. In fact, the surface of sheets of aluminum and ALUMINIZED STEEL after side-by-side exposure in an industrial atmosphere appear identical. Wide use of this special steel for applications such as building panels, roofing, siding and ventilators also demonstrates its weatherability and retention of its attractive appearance for many years.

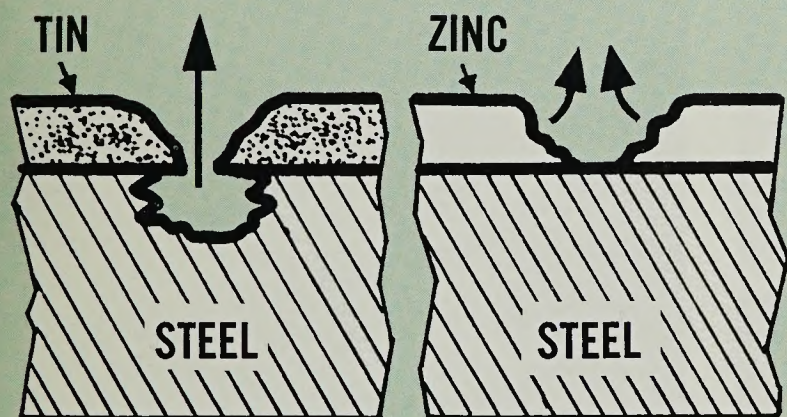


Figure 1

Perforations in tin, lead or other coatings below steel in the galvanic series do not protect the base metal. Actually the steel rusts away while protecting the coating. Zinc coatings, on the other hand, protect the steel base when it is exposed.

ARMCO ZINCGRIP STEEL

Armco ZINCGRIP Steel is the original continuous process hot-dip zinc-coated steel. This special zinc coating provides unbroken protection for the high quality cold-rolled steel base because it can be severely drawn or formed without flaking or peeling. In addition, because the coating on ZINCGRIP is applied in a carefully controlled continuous process, it has exceptional uniformity that assures maximum service life.

Advantages in Architecture

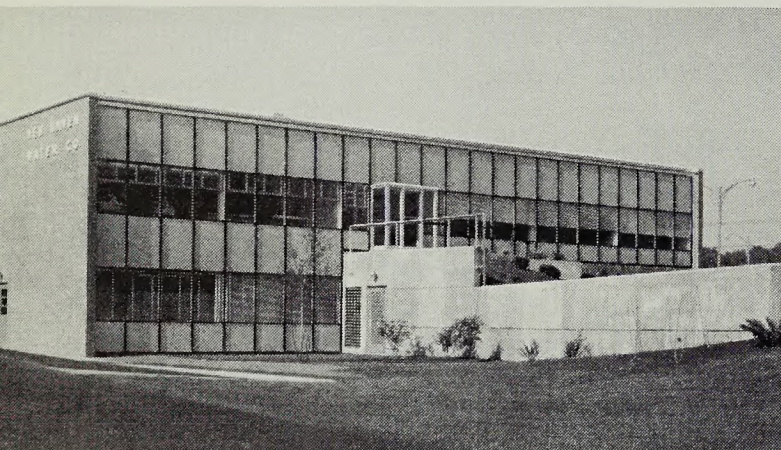
By combining the strength and rigidity of steel with economical and durable protection against rust, ZINCGRIP has been established as a basic architectural metal for almost twenty-five years. With the advent

of curtain wall construction and the widespread use of metal in factory-produced building products, ZINCGRIP is being specified for an increasing range of applications, including a great variety of standard building components.

Durability

ZINCGRIP Steel provides the maximum service life to be expected from a zinc coating. As discussed on page 2, the life of zinc coatings depends on their thickness. Besides having a full weight standard coating, ZINCGRIP has an exceptionally uniform coating with no thin spots to cause premature failure. In the Armco coating process, beta ray gages continuously measure coating thickness, assuring the precise control necessary to yield maximum and dependable protection against rusting. Of course, the ability of the coating on ZINCGRIP to resist flaking or peeling is added assurance that the material will give satisfactory service for the normal life of the coating.

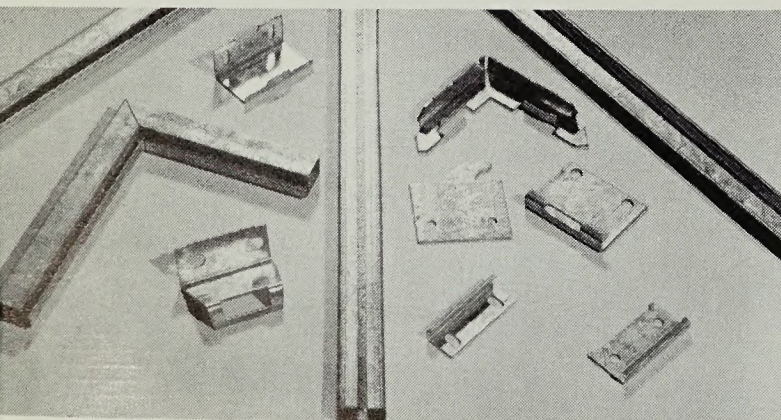
In many applications, the durability of ZINCGRIP eliminates the necessity of painting. However, where color is desired, it can be painted provided proper paints are used. If done on the job, zinc oxide-zinc dust primers or Portland cement base paints will give good paint adhesion without any treatment of the zinc surface. Suggested specifications for these materials



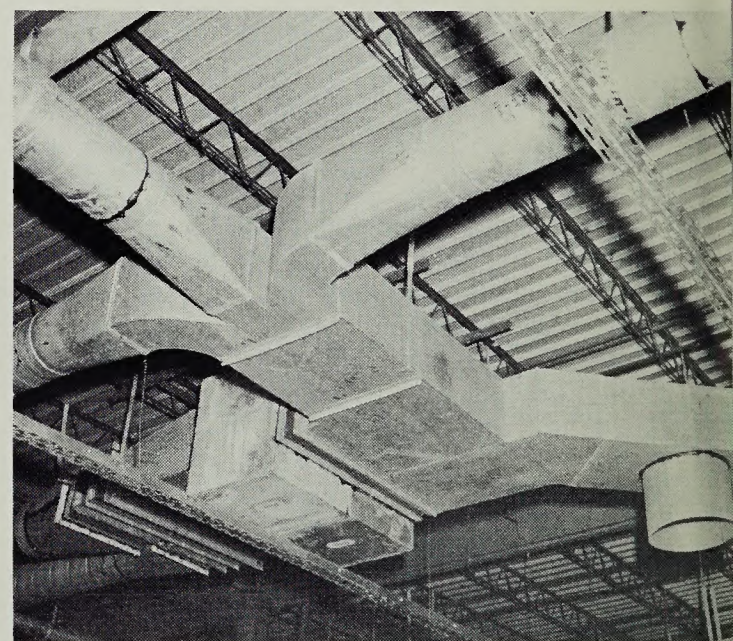
◀ **New Haven Water Company, Hamden, Connecticut**
Architects: Caproni Associates

A distinctive office with curtain walls of Armco ZINCGRIP Steel and porcelain enamel panels.

For schools where long life at low cost is paramount, ZINCGRIP curtain wall systems are ideal.



ZINCGRIP Steel can be roll-formed into rigid tubular shapes like these window screen sections. The special zinc-coating doesn't flake or peel.



▲ ZINCGRIP Steel is a standard metal for ductwork of all types. Its strength means fewer supports, its uniform ductile zinc coating assures long, rust-free service life.

are given on page 6. Other types of high quality paints will not adhere well to zinc without some type of surface treatment.

Because shop painting requires different paint schedules, building product manufacturers usually give ZINCGRIP a chemical surface treatment or use mill-treated ZINCGRIP PAINTGRIP to insure maximum paint life and adherence.

Strength

Providing the mechanical and physical properties of cold-rolled steel, ZINCGRIP is an efficient architectural material. It can be readily formed into strong, rigid tubular or other high load-bearing sections. Its high strength and modulus also simplify construction and fastening. The steel base of ZINCGRIP also means greater resistance to fire damage than is provided by non-ferrous metals.

ZINCGRIP Steel is not supplied on the basis of mechanical properties but rather to meet fabrication requirements most satisfactorily. However, mechanical properties fall within the range shown in Table 1 and permit the use of design standards for light gage cold-formed steel products.

Economy

ZINCGRIP Steel is an economical architectural metal

because its full-weight zinc coating gives lasting protection against rust, and its first cost is only a very few cents more per square foot than plain cold-rolled steel. In addition, the uniform thickness of the zinc coating and its freedom from flaking or peeling mean lowest maintenance costs.

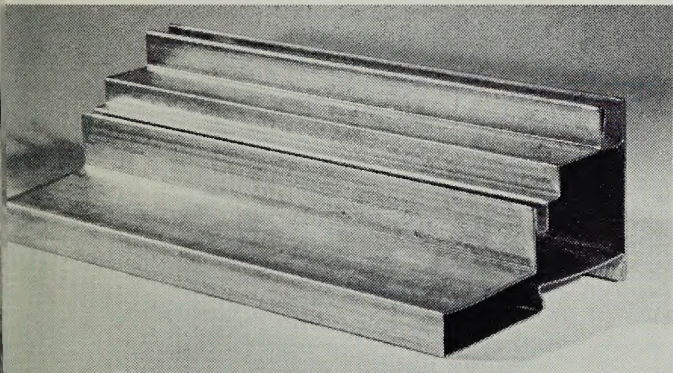
Available Forms and Products

Sheets and Coils

Armco ZINCGRIP Steel is produced in a wide range of thicknesses and sizes that enable the architect or the manufacturer of building products to specify material that meets exact needs.

Table 1—Typical Mechanical Properties of Armco ZINCGRIP

Ultimate Tensile Strength, psi	52,000
Yield Strength, psi	40,000
Elongation, % in 2"	27
Hardness, Rockwell	B62
Modulus of Elasticity, psi	29,000,000



A roll-formed ZINCGRIP Steel window section demonstrates the formability of the material.



Sunset Elementary School, Bellevue School District, Washington
Architects: Naramore, Bain, Brady & Johanson
Zinc-coated steel provides the structural strength and durability for trim, low-cost walkway covers.

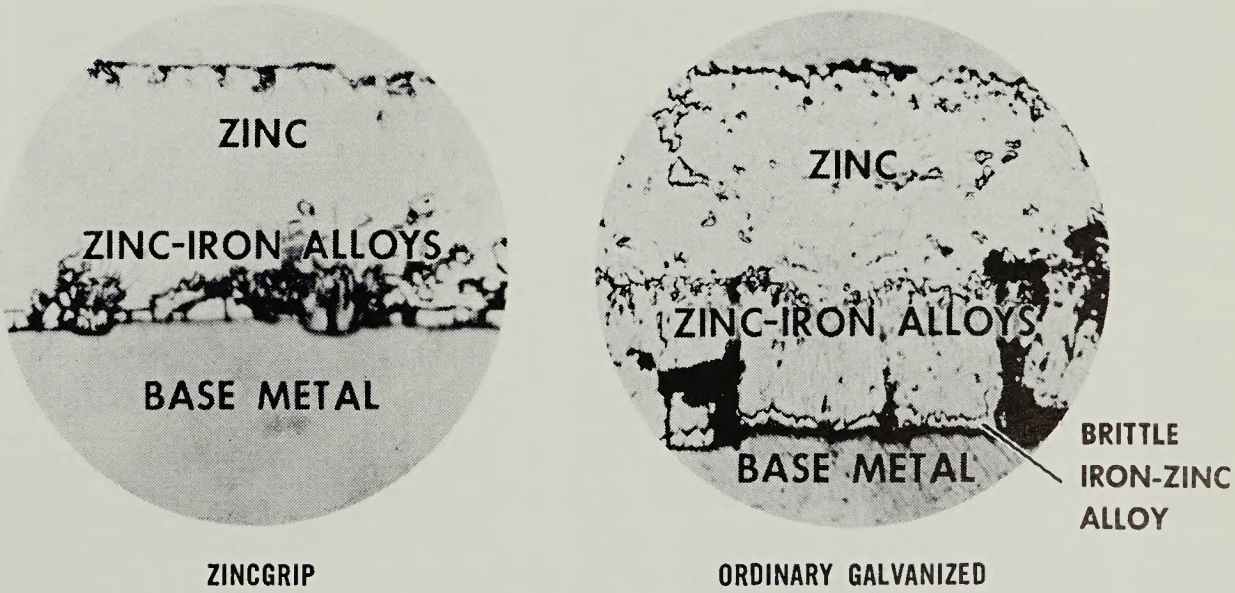


Figure 2
Photomicrographs of the coating on ZINCGRIP and ordinary galvanized steel. Both materials have been stretched 15 to 20%. Absence of brittle zinc-iron alloys insures good adherence of the zinc coating. Cracks, dark areas, in the zinc-iron layer of the galvanized material cause the coating to flake and peel.

The range of available thicknesses and maximum sizes of both sheets and coils is listed in Table 2.

Building Products

Because Armco ZINCGRIP Steel provides such economical durability and can be fabricated by regular production methods without damaging the special zinc coating, it is widely used for standard building products.

Curtain wall framing, air conditioning-heating ducts, windows, doors, door bucks, interior facing of curtain wall panels, rolling doors, roofing, hardware, and ceiling systems are only a few of many products made of this durable zinc-protected Armco Steel.

Suggested Specifications

Closed Specification: All sheet metal items not otherwise specified shall be Armco ZINCGRIP Steel, a cold-rolled low carbon sheet steel (SAE 1008) coated on both sides with a layer of zinc applied by the continuous hot-dip method. The zinc coating shall be 1.25 ounces per sq. ft. commercial in accordance with ASTM Specification A-93-latest revision, and shall have 0.90 ounces per sq. ft. minimum by the triple

spot test and 0.80 ounces per sq. ft. minimum by the single spot test.

Where closed specifications are not permitted, the first sentence of the specification can be amended as follows: All sheet metal items not otherwise specified shall be cold-rolled low carbon steel sheet (SAE 1008) coated on both sides with a layer of zinc applied by the continuous hot-dip method.

Paints for Field Application: Zinc-coated sheet metal items to be field painted shall be prime coated with Type I or Type II zinc oxide-zinc dust paint. These priming paints shall be in accordance with applicable sections of Federal Specification TT-P-641b and applied in an approved manner. They also can be painted with recommended oil vehicle Portland cement base paint applied in accordance with manufacturer's recommendations.

Standard paint schedules can be used for zinc-coated steel pre-treated for painting.

Table 2—Available Thicknesses and Sizes of ZINCGRIP Sheets and Coils

Nominal Thickness,* in.	Gage No.	Wt. Per Sq. Ft. Lbs.	Sheet Size Limits		Coils Max. Width
			Max. Width	Max. Length	
.1682	8	7.031	60"	240"	—
.1532	9	6.406			
.1382	10	5.781			
.1233	11	5.156			
.1084	12	4.531			
.0934	13	3.906			
.0785	14	3.281	60"	240"	51"
.0710	15	2.969			
.0635	16	2.656			
.0575	17	2.406			
.0516	18	2.156			
.0456	19	1.906	51"	200"	
.0396	20	1.656			
.0366	21	1.531	48" 51"	200" 144"	
.0336	22	1.406	48"	200"	48"
.0306	23	1.281			
.0276	24	1.156			
.0247	25	1.031			
.0217	26	.906			
.0202	27	.844	45"	200"	45"
.0187	28	.781			
.0172	29	.719			
.0160	30	.656			

*Note: Only the decimal thicknesses for gage numbers are listed. In mill quantities, within the limits of .1756" to .0157", ZINCGRIP Steel can be ordered to any decimal thickness.



Windows made of ZINCGRIP Steel, in a wide range of styles and sizes, combine durability, rigidity and attractive appearance.

ARMCO ZINCGRIP PAINTGRIP STEEL

Armco ZINCGRIP PAINTGRIP is basically the same material as ZINCGRIP, but it has a special mill-applied treatment that gives it exceptional paint-holding and paint-preserving properties. Like the tenaciously bonded, ductile zinc coating, the special surface on ZINCGRIP PAINTGRIP is not damaged by drawing or forming operations.

Advantages in Architecture

This special Armco Steel has all the advantages of ZINCGRIP—durability, strength, and economy—plus

the ability to take paint and to extend useful paint life.

The mill-treated type surface on ZINCGRIP PAINTGRIP provides an inert absorbent film that anchors paint. It also acts as an insulating barrier that prevents the drying action of zinc on paint oils.

An additional advantage of ZINCGRIP PAINTGRIP is its ability to prevent base metal corrosion when paint failure occurs due to chalking and erosion. This assures minimum repainting expense. By merely removing chalked paint with a dusting brush the surface is ready for painting. Light weight zinc coatings (.1 oz.) because of the minimum protection they afford, are apt to show pinpoint rusting of the base metal before paint failure is apparent. Removal of such rust is difficult and expensive. In addition, paint on rusted areas even when they have been thoroughly cleaned is subject to early failure.

Available Forms and Products

Sheets and Coils

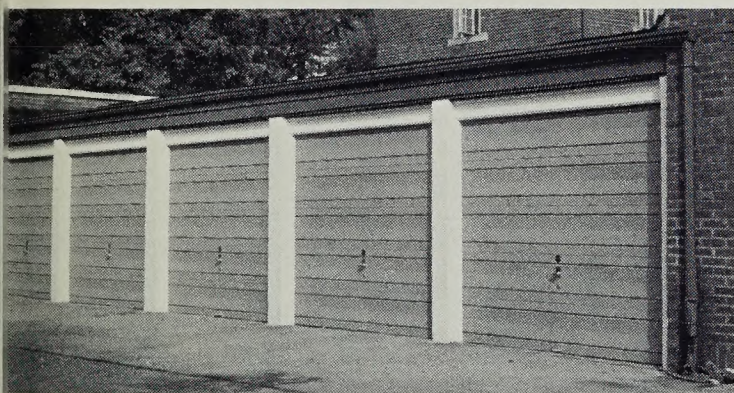
Armco ZINCGRIP PAINTGRIP Steel is also produced in a wide range of thicknesses and sizes to meet the varied needs of both architect and manufacturer most effectively.

Available thicknesses and maximum sizes of sheets and coils are listed in Table 3.

Table 3—Available Thicknesses and Sizes of ZINCGRIP PAINTGRIP Sheets and Coils

Nominal Thickness,* in.	Gage No.	Wt. Per Sq. Ft. Lbs.	Sheet Size Limits		Coils Max. Width	
			Max. Width	Max. Length		
.0785	14	3.281	60"	200"	60"	
.0710	15	2.969				
.0635	16	2.656				
.0575	17	2.406				
.0516	18	2.156				
.0456	19	1.906				
.0396	20	1.656				
.0366	21	1.531	36" 51"	168" 144"	48"	
.0336	22	1.406	48" 36"	144" 168"		
.0306	23	1.281	48"	144"		
.0276	24	1.156	36"	156"		
.0247	25	1.031	48"	144"		
.0217	26	.906				
.0202	27	.844	36"	144"	36"	
.0187	28	.781				

*Within the thickness limits of .0859" to .0180", Armco ZINCGRIP PAINTGRIP Steel can be ordered in mill quantities to any given decimal thickness.



LEFT ABOVE: Garage doors retain their attractive appearance, require little maintenance when made of Armco ZINCGRIP PAINTGRIP.

LEFT: Its rust-resistance and paint preserving qualities make ZINCGRIP PAINTGRIP ideal for the interior facings of curtain wall panels.

RIGHT ABOVE: Roof drainage of ZINCGRIP PAINTGRIP Steel stays attractive, eliminates paint peeling.



Building Products

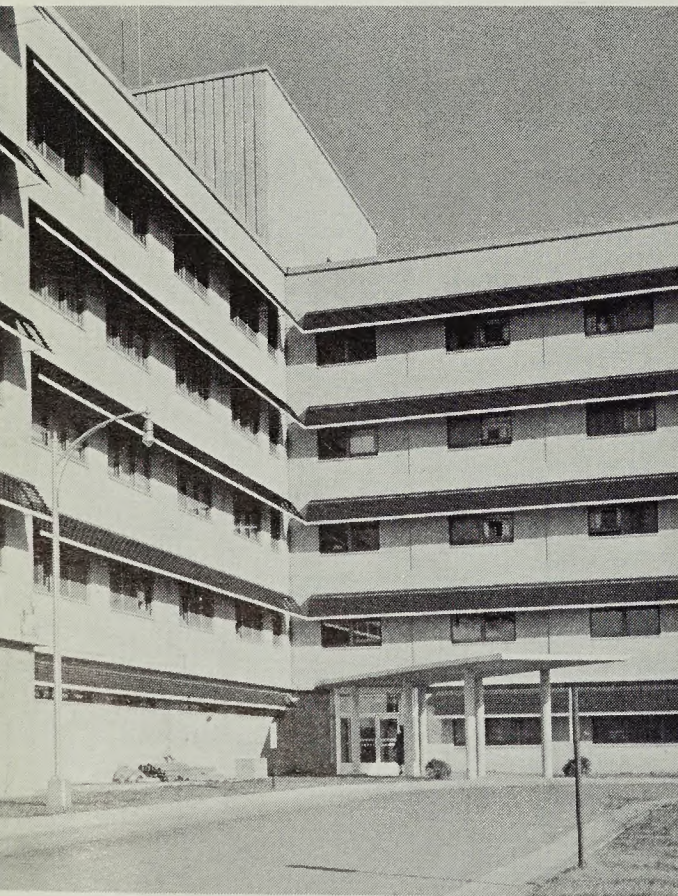
Because Armco ZINCGRIP PAINTGRIP Steel has all the advantages of time-proved ZINCGRIP plus the ability to take and hold paint, it is a standard material for many types of building products. With the contemporary trend to the use of more color, it has assumed even greater importance as an architectural metal.

Windows, doors and door frames, interior facing of curtain wall panels, curtain wall framing, roof drainage, roof deck, shower cabinets, toilet partitions, and building panels are typical standard building products made of Armco ZINCGRIP PAINTGRIP Steel. In general, wherever units are exposed to moisture or weathering yet must be painted for appearance, manufacturers find this paintable zinc-coated Armco Steel a most satisfactory and economical material. For custom-designed building components, especially those that must be painted on the job, the combination of low-cost durability and ready-to-paint surface offers time and money-saving advantages.

Suggested Specifications

Closed Specification: All sheet metal to be painted or sheet metal units as noted shall be Armco ZINCGRIP PAINTGRIP Steel, a cold-rolled low carbon sheet steel (SAE 1008) coated on both sides with a layer of zinc applied by the continuous hot-dip method and followed by a special paint-holding treatment at the mill. The zinc coating shall be 1.25 ounces per sq. ft. commercial in accordance with ASTM Specification A-93-latest revision and shall have 0.90 ounces per sq. ft. minimum by the triple spot test and 0.80 ounces per sq. ft. minimum by the single spot test.

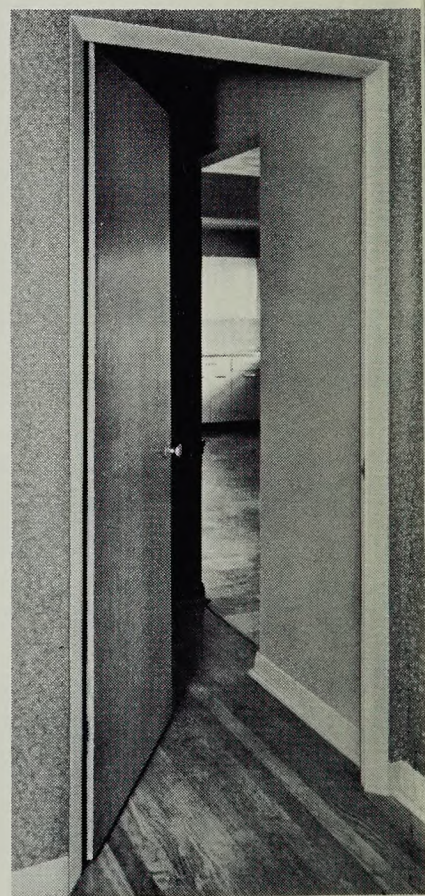
Where closed specifications are not permitted, the first sentence of the above specification can be amended as follows: All sheet metal to be painted and all painted sheet metal units as noted shall be cold-rolled low carbon steel sheet (SAE 1008) coated on both sides with a layer of zinc applied by the continuous hot-dip method and followed by a paint-holding treatment at the mill.



Sturdy door jambs made of Armco ZINCGRIP PAINTGRIP Steel are ready for painting, have rust-resistance that means low maintenance service.

ZINCGRIP PAINTGRIP Steel provides an efficient combination of strength, paintability, durability and low cost for sunshades and related building products.

Steel doors and frames made of ZINCGRIP PAINTGRIP are rigid, dimensionally stable, and easy to install. Their durability and paint-holding qualities please clients.



ARMCO ALUMINIZED STEEL Type 2

Armco ALUMINIZED STEEL Type 2 is sheet steel coated on both sides with aluminum by the Armco-developed, patented hot-dip process. The steel base is high quality cold-rolled steel to which an aluminum coating approximately .002" thick is applied on each side. The material possesses the surface characteristics of aluminum and the physical and mechanical properties of steel. The special coating on ALUMINIZED STEEL not only adheres tightly to the base metal but being produced by a continuous process has remarkably uniform thickness and composition.

Advantages in Architecture

By combining the advantages of both steel and aluminum, ALUMINIZED STEEL provides architects with a two-in-one metal that has superior corrosion resistance to unpainted galvanized sheet steel, and is less expensive than aluminum or stainless steel. It does not require paint but can be painted where color is desired. Consequently, this special aluminum-coated steel is ideal for many architectural uses.

Durability

The durability of ALUMINIZED STEEL, discussed on page 3, is proved in twenty-one-year exposure tests and in satisfactory service in a wide variety of architectural applications. On the basis of both appearance and structural integrity after long-time weathering, this special steel performs as well or better than any other material in its price class.

The tightly adherent coating on ALUMINIZED STEEL Type 2 permits fabrication of building products with-

out flaked areas that cause premature rusting. ALUMINIZED STEEL Type 2 can be bent to a radius equal to thickness without any flaking or peeling of the coating. However, sharp radii should be avoided because some crazing of the coating may occur and cause discoloration on exposure. This discoloration does not increase with time and its cause can be minimized by specifying larger bend radii.

Strength

The steel base of ALUMINIZED STEEL gives it all the advantages of the mechanical and physical properties of steel. High strength and modulus of elasticity make possible efficient economical sections for roof decking, building panels, roofing, siding and other load-bearing building components. Design is simplified because standard data for the design of light gage cold-formed steel products apply to ALUMINIZED STEEL Type 2.

Added advantages of this architectural steel are its low coefficient of thermal expansion that minimizes expansion and contraction problems, and its resistance to fire damage.

Heat Reflectivity

Another desirable property of ALUMINIZED STEEL, particularly useful in many architectural applications, is its ability to reflect radiant heat. The aluminum coating reflects approximately 80% of such radiant energy, making it very effective in reducing unwanted solar heat and retaining costly generated heat.

A wide variety of standard building panels is made of Armco ALUMINIZED STEEL Type 2.



Table 4—Typical Mechanical Properties of
Armco ALUMINIZED STEEL Type 2

Ultimate Tensile Strength, psi	54,000
Yield Strength, psi	40,000
Elongation, % in 2"	22
Hardness, Rockwell	B65
Modulus of Elasticity, psi	29,000,000

Economy

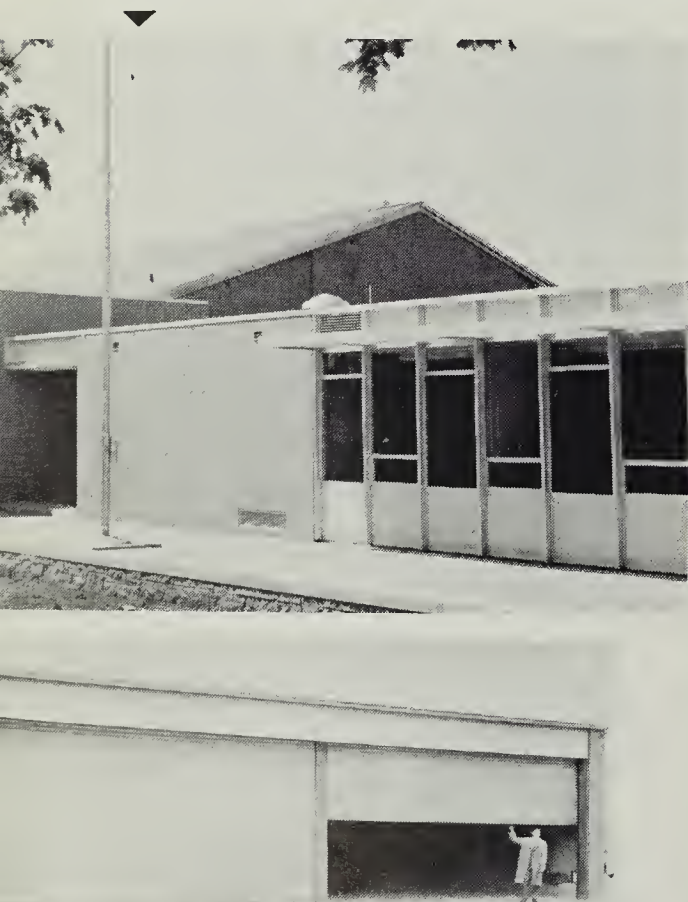
The combination of high strength and excellent corrosion resistance of ALUMINIZED STEEL Type 2 makes it a highly economical material for building components exposed to the weather. In comparison with aluminum, material costs can be reduced by about 30 to 45% using equal thicknesses. If full advantage is taken of the greater strength of ALUMINIZED STEEL by using thinner sections, savings can go as high as approximately 60%. For first-cost evaluation, the approximate per square foot costs of ALUMINIZED STEEL and zinc-coated steels are listed in Table 5. This data shows the low differential for Armco's aluminum-protected steel and indicates clearly why it is so economical in architecture.

Available Forms and Products

Sheets and Coils

Armco ALUMINIZED STEEL Type 2 sheets and coils are produced in a wide range of thicknesses and sizes. Both architects and manufacturers of building products can select the material that most economically meets their needs with a minimum of compromise. Both coils and cut lengths are produced.

ALUMINIZED STEEL is specified for roofing on schools because of its low cost and proved resistance to weathering.



ALUMINIZED STEEL is economical for a wide range of buildings.

Rolling doors are a typical building product where hot-dip aluminum-coated steel yields excellent service with minimum maintenance.

Table 6 lists the available thicknesses as well as maximum sizes and weights per square foot. Because of the low density of the aluminum coating, the data in Table 6 differ from standard gage-weight data. Therefore, this information should be used in all design and fabrication computations for ALUMINIZED STEEL Type 2.

Building Products

In addition to applications such as corrugated roofing and siding, roof and floor deck, and building panels where ALUMINIZED STEEL Type 2 offers such obvious advantages, it is also being used in increasing quantity for many other types of building products. Typical examples include central air conditioner housings, accoustical tile, ceiling panels, ductwork, overhead and rolling doors, screen frames, weather shields for industrial equipment, interior facing for curtain wall panels, and ventilators of all types.

Suggested Specifications

Closed Specification: All exterior sheet metal except where otherwise noted on the drawings shall be Armco ALUMINIZED STEEL Type 2, a cold-rolled low-carbon sheet steel (SAE 1008) coated on both sides with a layer of aluminum applied by the continuous hot-dip method. Coating weight shall be 0.75 ounces per sq. ft. minimum, total both sides, as determined by the triple spot test.

Where open specifications must be used, the first sentence of the specification can be revised as follows: All exterior sheet metal except where otherwise noted on the drawings shall be cold-rolled low-carbon sheet steel (SAE 1008) coated on both sides with a layer of aluminum applied by the continuous hot-dip method.

Table 5—Approximate Material Costs* of Armco Metallic-Coated Steels
Cost—Cents per Square Foot

Thickness, in.	Gage No.	Cold-Rolled PAINTGRIP	ZINCGRIP	ZINCGRIP PAINTGRIP	ALUMINIZED STEEL Type 2
.080	14	.278	.268	.281	.322
.065	15-16	.227	.224	.235	.269
.050	18	.178	.178	.186	.212
.040	20	.145	.145	.154	.173
.026	24-25	.100	.101	.107	.124

*Cost data is approximate, since some variable and minor factors are necessarily omitted. Data are based on cut sheets 24" to 30" wide by 60" to 168" long and quantities of 10,000 lbs.

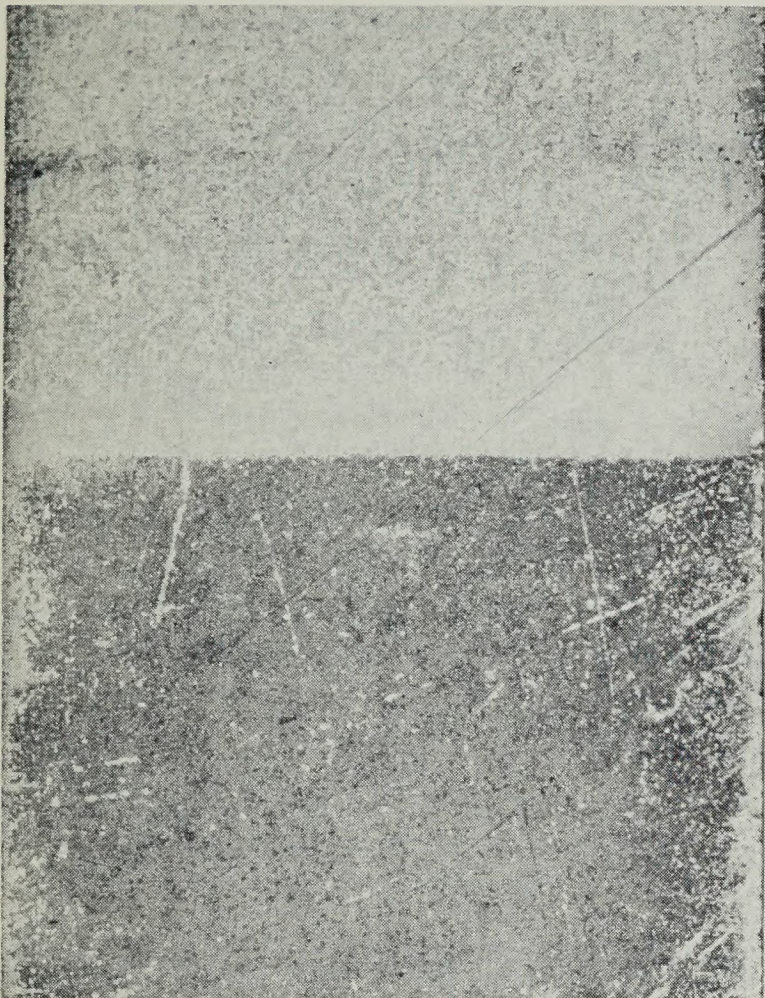


Figure 3—A sheet of ALUMINIZED STEEL Type 2 exposed to an industrial atmosphere for 21 years. The top half of the sheet has been cleaned of surface dirt to show that the aluminum coating is still protecting the steel base.

Figure 4—Corrosion test samples in an industrial atmosphere for 10 years show that ALUMINIZED STEEL weathers like aluminum.

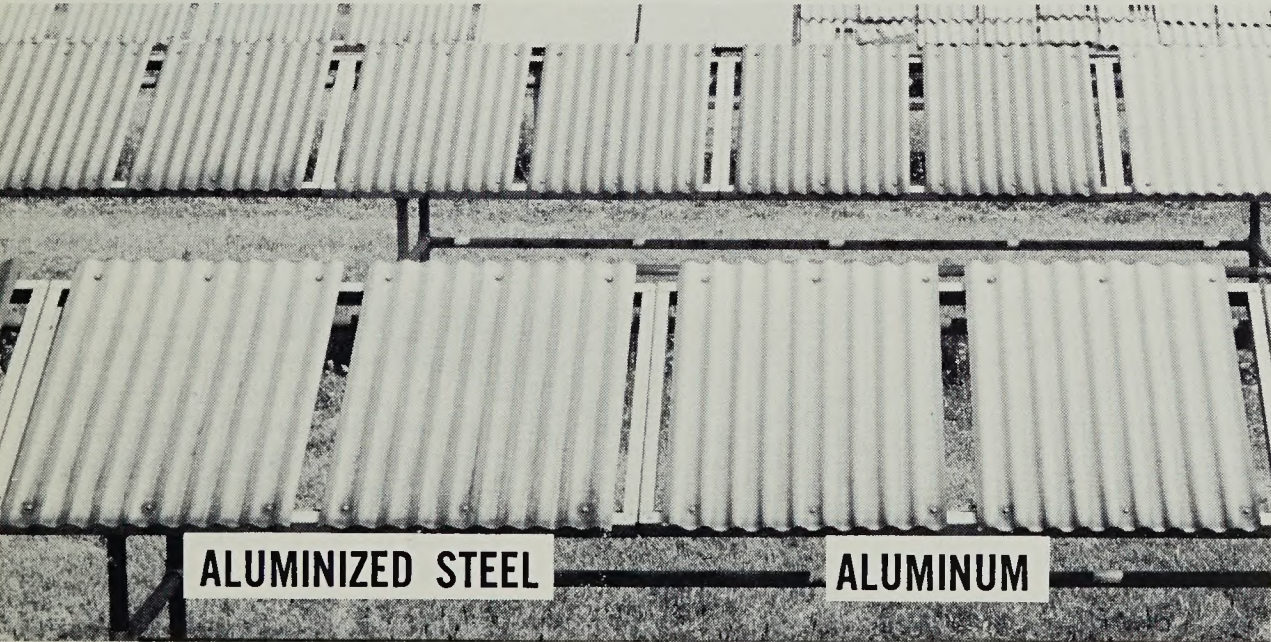


Table 6—Available Thicknesses and Sizes of ALUMINIZED STEEL Type 2 Sheet and Coils

Nominal Thickness,* in.	Gage No.	Mean Wt. Per Sq. Ft. Lbs.	Sheet Size Limits		Coils Max. Width
			Max. Width	Max. Length	
.0934	13	3.789	36"	192"	36"
.0785	14	3.164	48"	192"	48"
.0716	15	2.852			
.0635	16	2.539			
.0575	17	2.289			
.0516	18	2.039			
.0456	19	1.789			
.0396	20	1.539			
.0366	21	1.414			
.0336	22	1.289			
.0306	23	1.164			
.0276	24	1.039			
.0247	25	.914	44"	192"	40"
.0217	26	.789			
.0202	27	.727	42"	144"	36"
.0187	28	.664			

*Within the thickness limits of .1008" to .0180", Armco ALUMINIZED STEEL Type 2 can be ordered in mill quantities to any given decimal thickness.

Floor deck is a typical application where the strength and durability of ALUMINIZED STEEL yield cost-cutting advantages.



ARMCO BUILDING PRODUCTS

Armco Deep Corrugation

All three Armco Metallic-Coated Steels are available in the form of corrugated sheets including the new Armco Deep Corrugation that permits more efficient design and requires less steel.

The new Armco Corrugation, $2\frac{2}{3}"$ by $\frac{7}{8}"$, offers greatly increased beam strength and rigidity that give you several cost-cutting advantages.

Greater loads with same gage—Armco Deep Corrugation, with equal purlin spacing, will carry much greater loads than the same gage steel in the standard corrugation.

Same load with less steel—The greater load-carrying capacity of the deep corrugation permits appreciable gage reductions for the same design loads. For example, Armco Deep Corrugation in 24 gage has prac-

tically the same strength for all purlin spacings as 16 gage standard corrugation.

Fewer purlins required—For the same loading, much wider purlin spacing can be used with the Armco Deep Corrugation. Or both wider purlin spacing and reduction in gage can be made simultaneously. The sketches in Fig. 6 show the possibilities for a loading of 30 lb. per sq. ft.

Comparison with aluminum—Compared with corrugated aluminum sheets, on an equal strength basis, savings of approximately 40% or more are possible with the Armco Deep Corrugation. Amount of savings depends on the gage used and whether the material is ZINGRIP or ALUMINIZED STEEL.

The sizes and gages of Armco Deep Corrugation available in ZINGRIP, ZINGRIP PAINTGRIP and ALUMINIZED STEEL Type 2 are listed in Table 7.

Table 7—Available Thicknesses and Sizes of Armco Deep Corrugation

Thickness, in.	Gage No.	Widths of Sheets after corrugation, in.	Maximum Length, in.
.0276	24	26, $27\frac{1}{4}$, $29\frac{3}{4}$, $32\frac{1}{2}$	144
.0217	26		

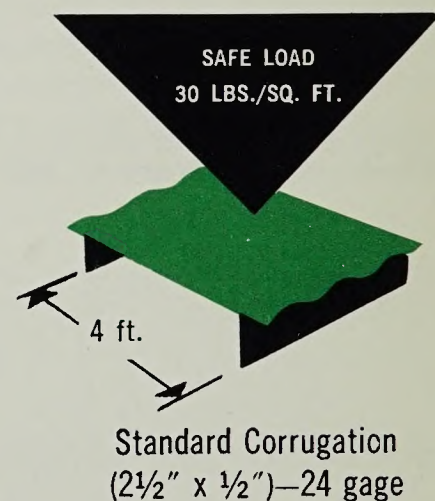
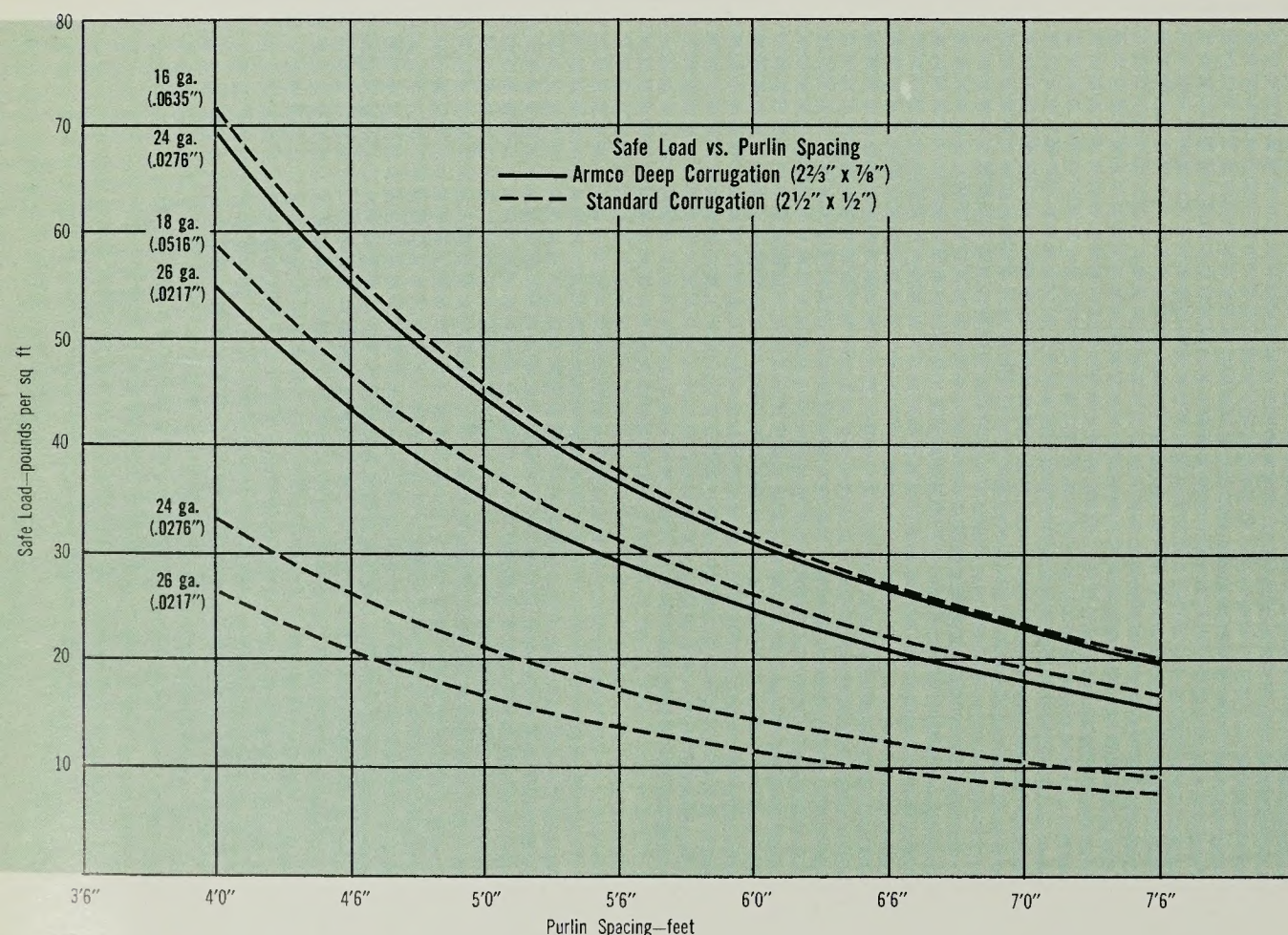


Figure 5—Graph of safe loads at various purlin spacings for Armco Deep Corrugation and standard $2\frac{1}{2}"$ by $\frac{1}{2}"$ corrugation. Safe loads were calculated according to the "AISI Light Gage Cold-Formed Steel Design Manual."

Figure 6—Wider purlin spacings and thickness reductions are possible with the Armco Deep Corrugation compared with the standard corrugation.

Armco ZINCGRIP and ALUMINIZED STEEL Welded Tubing

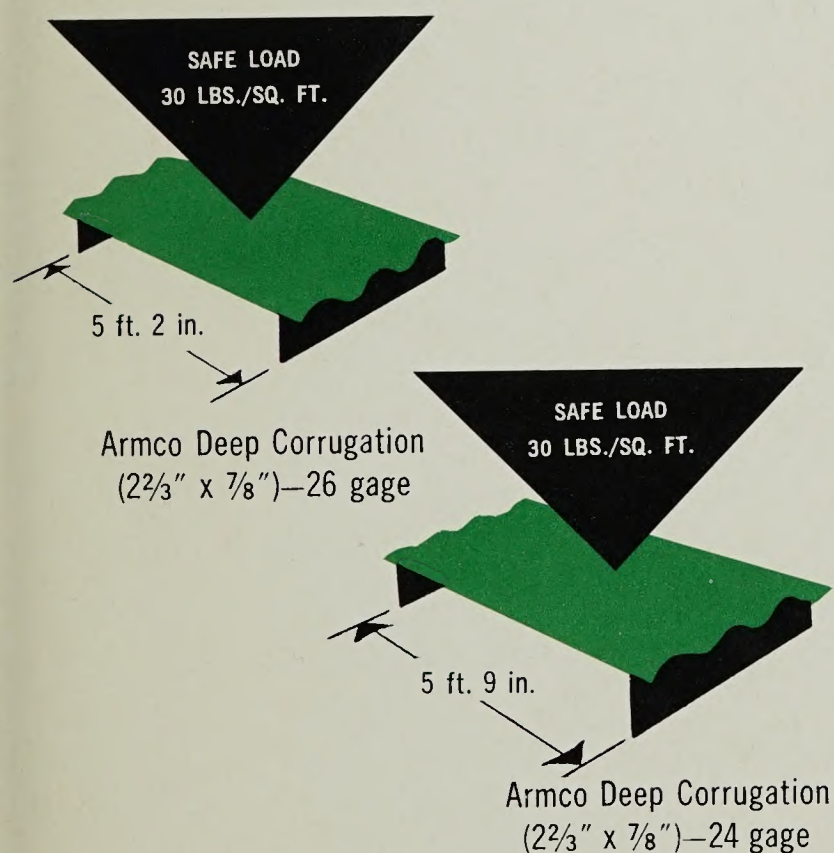
Armco Welded Steel Tubing made of ZINCGRIP or ALUMINIZED STEEL Type 2 has all the structural advantages of this efficient steel form, plus the durability provided by these metallic coatings. Both types of tubing eliminate the necessity of painting although either can be painted if required for appearance.

Available sizes, wall thicknesses and shapes in each material are listed in Table 8.

Table 8—Available Sizes and Shapes of Armco ZINCGRIP and ALUMINIZED STEEL Type 2 Welded Tubing

Shape	Size, in.	Wall Thickness*			
		ZINCGRIP in.	Gage No.	ALUMINIZED STEEL in.	Gage No.
Round	3/8" to 3" O.D.	.109 to .035	12 to 20	.095-.035	13 to 20
Square	3/8" to 2 3/8"	.109 to .035	12 to 20	.095-.035	13 to 20
Rectangular (ZINCGRIP only)	Perimeter equal to that of sq. tubing	.109 to .035	12 to 20	—	—

*Wall thicknesses depend upon size of tubing.



OTHER ARMCO STEELS FOR ARCHITECTURE

Armco Enameling Iron

This product is sheet iron of exceptional purity that is especially processed for porcelain enameling. Used more than any other base metal for architectural porcelain enamel, it helps assure panel flatness and uniformly high quality porcelain enamel.

Architects use this special metal to achieve color and form in design. It is specified for formed, embossed or flat exterior facing of curtain walls; interior facing where color and maximum durability are required; fascia and window surrounds; for murals with lifetime beauty; and signs or other building identification that must have lasting color and be maintenance-free.

Armco Stainless Steels

An established medium of architectural expression wherever beauty and durability are paramount, stainless steel is outstanding as a functional material in contemporary architecture. The high strength, hardness, excellent corrosion resistance and handsome appearance of Armco Stainless Steels expand the design possibilities with curtain walls and enable durable beauty to be made an integral part of the structure.

Readily fabricated and available in a wide variety of finishes, Armco Stainless is ideal for wall panels, mullion elements, column enframements, doors, windows, hardware and a wide range of uses in custom applications or standard building products.

Useful Information Available

Literature describing the properties and fabrication of each of these Armco Special-Purpose Steels and their application in architecture is available. For any of these booklets or additional information on Armco's Metallic-Coated Steels—ZINCGRIP, ZINCGRIP PAINTGRIP, and ALUMINIZED STEEL Type 2—just write to Armco's home office or contact the Armco Sales Office nearest you.

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Minneapolis 2, Minnesota
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New York 17, New York
Chrysler Bldg.

Philadelphia 7, Pennsylvania
1808 Phila. Natl. Bank Bldg.

Pittsburgh 22, Pennsylvania
2 Gateway Center

St. Louis 5, Missouri
10 S. Brentwood Blvd.

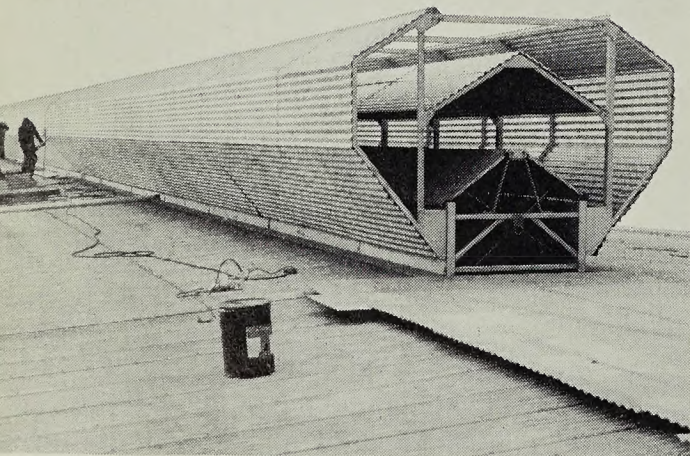
Tulsa 3, Oklahoma
201 K O M E Bldg.



Portland, Oregon, N.C.
Architects: Guy E. Crampton
& Associates

Armco ZINGRIP PAINTGRIP was specified for the gravel stop fascia and sunshades of this attractive bowling lanes building.

Hot-dip aluminum-coated steel provides the strength and corrosion resistance for economical ventilators and similar products.



ARMCO DIVISION



ARMCO STEEL CORPORATION

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